

Fan Coil Unit



Job Information		Technical Data Sheet
Job Name	Webster Univ Science Bldg	
Date	7/5/2016	
Submitted By	Thermal Mechanics, Inc.	
Software Version	04.60	
Quantity	2	
Unit Tag	CUH-203, 204	



Unit Overview					
Model Number	Unit Size	Voltage V/Hz/Phase	Air Flow CFM	External Static Pressure inH ₂ O	Unit Configuration
FHHR204	04	115/60/1	358.4	0.00	Horizontal

Unit	
Model Number:	FHHR204
Type:	Cabinet Unit Heater
Orientation:	Horizontal
Size:	04
Cabinet:	Recessed with Ceiling Panel
Approval	ETL, CETL, AHRI

Physical			
Unit			
Depth	Width	Height	Shipping Weight
35.0 in	53.1 in	14.5 in	108 lb
Filters			
Type	(Quantity) Height x Width x Depth		
1 in MERV 4	(1) 10.75 in x 24.75 in x 1 in		

Electrical			
Unit			
Voltage	Fan Motor Amps	Unit MCA	Unit MROPD (Calculated)
115/60/1 V/Hz/Phase	4.2 A	5.3 A	9.6 A

Hot Water Coil				
Physical				
Fins per Inch	Number of Rows		Coil Circuits	Face Area
12	2		2	1.0 ft²
Performance				
Total Capacity Btu/hr	Temperature			
	Air		Fluid	
	Entering °F	Leaving °F	Entering °F	Leaving °F
18521	68.0	113.8	140.0	122.4
Fluid				
Type	Flow rate gpm		Pressure Drop ft H₂O	
Water	2.1		0.9	

Supply Fan

Fan

Fan Height	Fan Width	Quantity
8.00 in	6.00 in	2

Motor

Type	Horsepower	Quantity
Field Adjustable ECM	1/4 hp	1

Sound

Casing Radiated Sound Power (db)

125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
54	53	52	48	42	34	33

Options

General

Cabinet Style:	Standard
Cabinet Coating:	Premium
Cabinet Color:	Antique Ivory
Cabinet Plenum Insulation:	1/2 inch Fiberglass
Cabinet Gauge:	18 Gauge
Return Air Location:	Bottom
Disconnect Switch:	Disconnect Switch

Warranty

Warranty: Standard

AHRI Certification



All equipment is rated and certified in accordance with AHRI 440.

Notes

Sound Power (dB) measured in accordance with ANSI/AHRI Standard 260-2008.

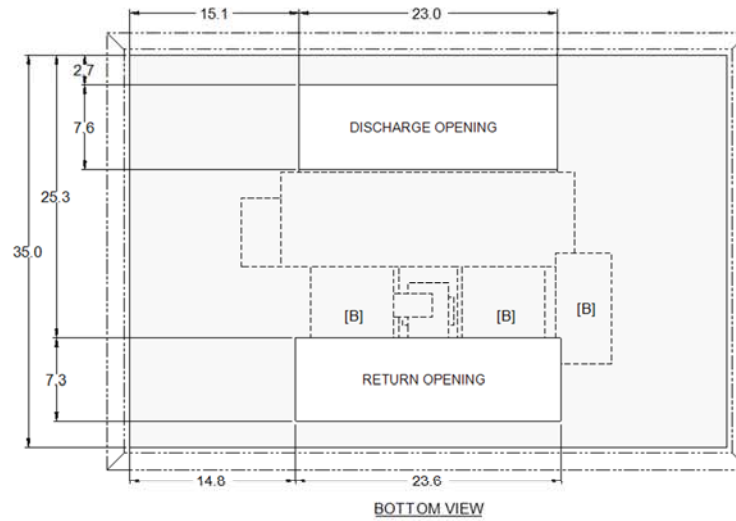
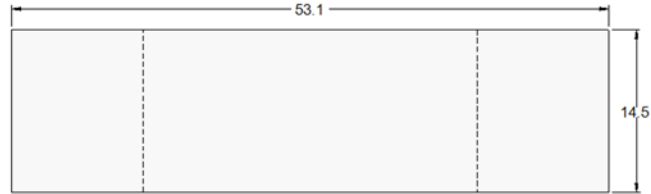
Total sound power level data based On units With 115/1/60 volt PSC motor at corresponding motor speed, 4 row coil, 1" throwaway filter, unit standard insulation, 0.0" external Static pressure And standard rated internal pressure losses.

Accessories

Mandatory

Part Number	Description
910135227	Trim Flange Kit, Antique Ivory, sz 04

FRONT VIEW - LEFT HAND UNIT



BOTTOM VIEW

NOTES

[B] - Fan Housing

[B] - Electrical Control Box

Product Drawing

Product:

Model: FHHR204

Unit Tag: CUH-203, 204

Project Name: Webster Univ Science Bldg

July 05, 2016

Ver/Rev:

Sheet: 1 of 1

Sales Office: Thermal Mechanics, Inc. (St. Louis)

Sales Engineer:

Scale: NTS

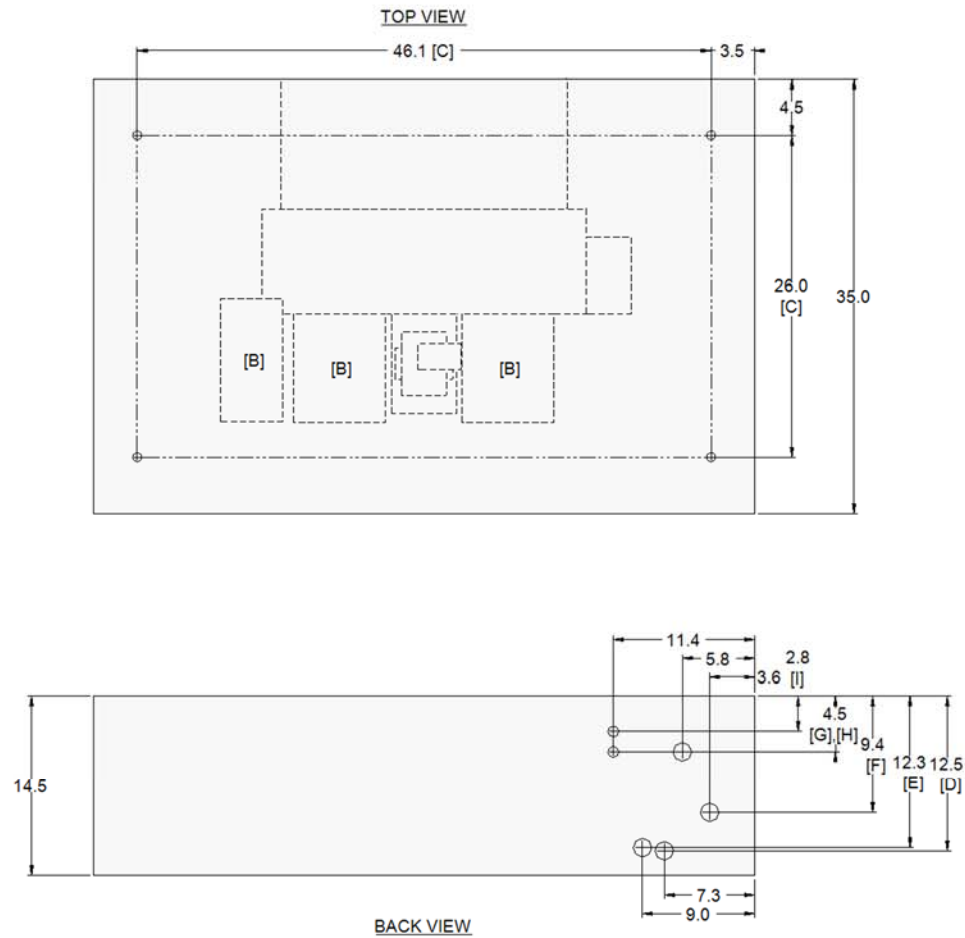
Tolerance: +/- 0.25"

Dwg Units: in



13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 04.60

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.



NOTES

[B] - Fan Housing	[B] - Electrical Control Box	[C] - (4) Mounting Holes - 0.75 DIA	[D] - Drain Conc Knockout - 1.5 DIA
[E] - Drain Conc Knockout - 1.5 DIA	[F] - Primary Sup Knockout - 1.5 DIA	[G] - Elec Conc - 0.875 DIA	[H] - Primary Ret Knockout - 1.5 DIA
[I] - Elec Conc - 0.875 DIA			

Product Drawing	Unit Tag: CUH-203, 204	Sales Office: Thermal Mechanics, Inc. (St. Louis)	 13600 Industrial Park Blvd. Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 04.60
Product:	Project Name: Webster Univ Science Bldg	Sales Engineer:	
Model: FHHR204	July 05, 2016 Ver/Rev: Sheet: 1 of 1	Scale: NTS Tolerance: +/- 0.25" Dwg Units: in	

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.



THERMAL MECHANICS, INC.

715 GODDARD AVENUE, CHESTERFIELD, MO 63005

VOICE (636) 532-1110

FAX (636) 532-7318

DATE: July 5, 2016

MAB

EQUIPMENT SUBMITTAL – REVISION “2”

PRODUCTION ON HOLD FOR APPROVAL

Production is on HOLD and will not be released or scheduled until receipt of approved submittals noting any changes required.

Manufacturer: **Daikin Applied**

Equipment: ***Cabinet Unit Heaters***

Spec Section: 235000.2.14

Job Name: **Webster University
Interdisciplinary Science Building**

Engineer: William Tao & Associates

Contractor: **Icon Mechanical**
Purchase Order #: **To Follow**

TMI Ref #: 160501

Contact: Jason Hibbits



THERMAL MECHANICS, INC.

715 GODDARD AVENUE, CHESTERFIELD, MO 63005

VOICE (636) 532-1110

FAX (636) 532-7318

DATE: July 5, 2016

MAB

SUBMITTAL COMMENTS/RESPONSE

July 1, 2016 Comments	July 5, 2016 Response
1. Remove all control valves. Valves provided by control contactor.	Optional valve package and control valve has been removed from the cabinet heaters.
2. Is the disconnect factory mounted?	Yes
3. Remove all valve packages unless standard from the factory.	See above.

Webster Univ Science Bldg																					
Unit												Hot Water Heating Coil									
TAG	Model	Arrangement	Piping	Electrical			Supply Fan				Filters	EDB (°F)	LDB (°F)	FPI	Rows	Total Capacity (Btu/hr)	Entering Fluid Temp (°F)	Leaving Fluid Temp (°F)	Fluid Flow Rate (gpm)	Fluid Type	Fluid Pressure Drop (ft H ₂ O)
				Voltage	MCA	MROPD	Air Flow (CFM)	ESP (inH ₂ O)	Motor Power	Motor Type	Type										
CUH-101	FHHR202	Horizontal hideaway	Left	115/60/1	3.1	5.6	227	0.00	1/8	ECM	1 in MERV 4	68.0	126.1	12	3	14413	140.0	119.2	1.4	Water	0.5
CUH-102	FHVS106	Vertical slope top	Left	115/60/1	5.3	9.6	503	0.00	1/4	ECM	1 in MERV 4	68.0	125.2	12	4	31474	140.0	124.6	4.1	Water	6.2
CUH-201	FHHR202	Horizontal hideaway	Left	115/60/1	3.1	5.6	227	0.00	1/8	ECM	1 in MERV 4	68.0	126.1	12	3	14413	140.0	119.2	1.4	Water	0.5
CUH-202	FHHR202	Horizontal hideaway	Left	115/60/1	3.1	5.6	227	0.00	1/8	ECM	1 in MERV 4	68.0	126.1	12	3	14413	140.0	119.2	1.4	Water	0.5
CUH-203	FHHR204	Horizontal hideaway	Left	115/60/1	5.3	9.6	364	0.00	1/4	ECM	1 in MERV 4	68.0	113.8	12	2	18251	140.0	122.4	2.1	Water	0.9
CUH-204	FHHR204	Horizontal hideaway	Left	115/60/1	5.3	9.6	364	0.00	1/4	ECM	1 in MERV 4	68.0	113.8	12	2	18251	140.0	122.4	2.1	Water	0.9

- Notes:**
1. Field adjustable EC motors provided. Performance data is based on medium speed.
 2. Units are provided with the low voltage control interface package and non-fused disconnect switch

PART 1: GENERAL

1.01 SECTION INCLUDES

- A. Vertical Fan Coil
- B. Horizontal Fan Coil

1.02 REFERENCES

- A. Load Ratings and Fatigue Life for Ball Bearings.
- B. Standards Handbook.
- C. Laboratory Methods of Testing Fans for Rating Purposes.
- D. Test Code for Sound Rating Air Moving Devices.
- E. Test Methods for Louver, Dampers, and Shutters.
- F. Room Fan Coil Unit.
- G. Standard Practice for Operating Salt Spray Apparatus.
- H. Motors and Generators.
- I. National Electrical Code.
- J. HVAC Duct Construction Standards - Metal and Flexible
- K. Test for Surface Burning Characteristics of Building Materials.
- L. Test Performance of Air Filter Units.
- M. Standard for Heating and Cooling Equipment.
- N. Test for Flammability of Plastic Materials for Parts in Devices and Appliances.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, and electrical characteristics and connection requirements.
- B. Product Data
 - 1. Provide literature that indicates dimensions, weights, capacities, ratings, fan performance, gauges and finishes of materials, and electrical characteristics and connection requirements.

1.04 OPERATION AND MAINTENANCE DATA

- A. Maintenance Data: Include instructions for lubrication and filter replacement.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Air Handler products specified in this section must show a minimum five years documented experience and complete catalog data on total product.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site.
- B. Accept products on site wrapped in protective cardboard wrap. Inspect for damage.
- C. Store in a clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

PART 2: PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Daikin Applied - 'ThinLine 3G' Fan Coil is the basis of design.

2.02 FAN COIL TYPE AND ARRANGEMENT

- A. The fan coil shall be furnished as a draw-through coil.

2.03 CABINET

- A. Vertical units shall be supplied with powder coat painted cabinet. Finish must meet ASTM B117 specifications (salt spray test).
- B. Horizontal units shall be supplied with a powder coat painted cabinet and trim flange with powder coat paint. Finish must meet ASTM B117 specifications (salt spray test).

2.04 GENERAL CONSTRUCTION

- A. Cabineted units shall include a chassis, coil(s), fan deck with blower(s)/blower housing and motor(s). Steel parts exposed to moisture shall be galvanized and insulated to prevent condensation. The complete fan assembly shall be easily removable for service and maintenance.
- B. Horizontal hideaway
 - 1. Unit shall be supplied with return plenum complete with filter frame and filter. The plenum shall be fabricated of 18 gauge galvanized steel. The inside plenum surface shall be insulated with 1/2" matt-faced fiberglass insulation. Plenum insulation shall meet minimum K value of 0.24 (BTU-in)/(hr-ft²-F) and rated for maximum air velocity of 5000 fpm. Fiberglass insulation conforms to:
 - a. a. ASTM C1071 (including C665)
 - b. b. UL 181 for erosion
 - c. c. 25/50 rating for flame spread/smoke developed per ASTM E-84, UL 723 and NFPA 90A

2.05 SUPPLY FAN

- A. Supply fans shall be a DWDI forward-curved type. Fan assemblies including fan, motor and sheaves shall be dynamically balanced by the manufacturer on all three planes at all bearing supports. Manufacturer must ensure maximum fan RPM is below the first critical speed.
- B. The complete fan assembly, including motor and main drain pan shall be easily removable.
- C. Units shall be certified in accordance with the Room Fan Coil Unit certification program that is based on ARI Standard 440.
- D. An ECM blower motor shall be provided on all units. Factory motor wiring shall be set for optimum fan performance. The unit shall be shipped at one fixed setting. The ECM motor shall utilize a permanent magnet rotor, which is connected to the shaft through resilient rings to absorb high frequency torque ripple. ECM motor shall be programmed for constant CFM or constant torque.
- E. ECM blower motor shall be 3 speeds, single phase with means for proportional field adjustment of each speed.

2.06 ELECTRICAL

- A. Supply fans shall be driven by permanent split-capacitor motors that are run-tested in the assembled unit and permanently lubricated. All motors shall have integral thermal overload protection with a maximum ambient operating temperature of 104°F. Motors shall be capable of starting at 78 percent of rated voltage and operating at 90 percent of rated voltage on all speed settings. Motors can operate up to 10 percent overvoltage.
- B. Motor wires shall include a quick-disconnect motor plug.
- C. Non-fused disconnect/service switch to be factory installed.

2.07 COOLING AND HEATING

- A. Water/Steam Heating Coil

1. Heating performance shall be as specified on the unit schedule.
2. Coil fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Seamless copper tubes shall be mechanically expanded into the fins to provide a continuous primary-to-secondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tubes shall not be visible between fins.
3. Coils shall be provided with headers of seamless copper tubing with intruded tube holes to permit expansion and contraction without creating undue stress or strain. Coil connections shall be copper sweat connections with connection size to be determined by manufacturer based upon the most efficient coil circuiting. Vent and drain connections shall be furnished on the coil connection, external to the cabinet. Vent connections shall be provided at the highest point to ensure proper venting. Drain connections shall be provided at the lowest point.

2.08 VALVE PACKAGES

- A. Control valves and hydronic components are by others.

2.09 FILTERS

- A. Filters shall be 1" (25 mm) throwaway. They shall be concealed from sight and easily removable.

2.010 CONTROLS

- A. Unit shall be supplied with a DDC interface board and 50 vA control power transformer.
- B. DDC Interface board shall have three 24-volt relays with line-voltage contactors to operate the fan motor speeds.
- C. DDC interface board shall have terminal connections for interfacing to:
 1. Wall-Mounted Thermostat
 2. Low-voltage, on-off valve actuators.
 3. A return air sensor.
 4. A pipe temperature sensor for changeover from heating to cooling on two-pipe systems.
 5. Condensate overflow switch.
 6. Room occupancy sensor.

PART 3: EXECUTION

3.01 INSTALLATION

- A. The Thinline Fan Coil unit shall be installed per manufacturer's Installation & Maintenance Bulletin.
 1. Selected field mounted kits shall be specified on the unit schedule and installed per manufacturer's instruction.

Shop Drawing Submittal Review

Transmitted To: Cannon Design

Date: July 29, 2016

Attention: stl-cac@cannondesign.com

Contact Person / WTA Field Inspector:
Patrick Garner

Project Name: Webster University-**ISB**

Reviewed by: Mark Schaefer
Mike Nolte

Project No. WT 14127.01

☐ UPS ☐ Courier ☒ **Email**

Copies	No.	Description
1 PDF	235000M07	(Submittal No. 235000-007)
		• Daikin Cabinet Unit Heaters

Remarks:

c: **Kelvin Patel**
Kpatel@cannondesign.com

☒ **Furnish as Submitted**

☐ Furnish as Noted

☐ Rejected

☐ Revise & Resubmit

☐ Reviewed

☐

Corrections or comments made on shop drawings during this review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with the design concept of project and general compliance with information given in contract documents. Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

WTASHOP - FW: Tasks - Please approve 235000-008 Propeller unit heaters product data

From: STL-CAC <STL-CAC@CANNONDESIGN.COM>
To: "pgarner@wmtao.com" <pgarner@wmtao.com>, "wtashop@wmtao.com" <wtashop@wm...>
Date: 7/19/2016 2:01 PM
Subject: FW: Tasks - Please approve 235000-008 Propeller unit heaters product data
Cc: "Patel, Kelvin" <kpatel@CANNONDESIGN.COM>, "Grossman, Lynn" <lgrossman@C...>
Attachments: 235000-007 Cabinet unit heaters product data.pdf; 235000-008 Propeller unit heaters product data.pdf; 235000-005 Split system fan coils.pdf; 235000-006 Air handler 5 product data.pdf

Attached please find submittals for your review.

Thank you.

Lori Hill

CANNONDESIGN

225 North Michigan Ave, Suite 1100
Chicago, Illinois 60601

SUBMITTAL IDENTIFICATION SHEET

To be completed by Contractor/CM

PROJECT NAME	
ADDRESS	
NUMBER	
OWNER	
ARCHITECT / ENGINEER	
SUBMITTED BY	
CONTRACTOR / CM SUBMITTAL NO.	CANNON DESIGN SUBMITTAL NO.
DRAWING / DETAIL REFERENCE	SPECIFICATION SECTION / PARAGRAPH
MANUFACTURER / SUPPLIER	ITEM / PRODUCT ID
REQUIRED DATE	PRIORITY
CRITICALITY	

To be completed by Reviewer

CANNON DESIGN SUBMITTAL NUMBER
RECEIVED DATE

- ☐ **A. No Exceptions Taken**
No further review of submittal is required.
- ☐ **B. Make Corrections Noted**
Incorporate corrections in work;
resubmission is not required.
- ☐ **C. Revise and Resubmit**
Revise as noted, and resubmit for review.
- ☐ **D. Rejected**
Submittal is not in compliance with Contract Documents;
provide new submittal.
- ☐ **E. For Record / Information Only**
Submittal was reviewed for Record / Information
purposes only.
- ☐ **F. Not Required for Review**
Submittal is not required by Contract Documents
and has not been reviewed.

Review is for conformance with the design concept of this project and for general compliance with contract documents. Contractor is responsible for quantities, dimensions and compliance with contract documents and for information that pertains to fabrication processes, construction techniques and coordination of this work with all trades which will be affected thereby. This review is null and void if submittal deviates from contract documents and does not indicate or note deviations.

ITEM BEING SUBMITTED (check only one)

- ☐ Shop Drawings ☐ Certification / Qualifications ☐ Coordination Drawing
☐ Samples ☐ Record Documents ☐ Calculations
 (_____ copies) ☐ Product Data ☐ Schedules
☐ LEED Submittal ☐ O&M Manuals
☐ Other

ITEM BEING SUBMITTED FOR (check only one)

- ☐ Action ☐ Information Only ☐ Record

REMARKS OR DEVIATIONS

CONTRACTOR / CM CERTIFICATION
(SUBMITTALS NOT CERTIFIED WILL BE RETURNED WITHOUT REVIEW)



PARIC CORPORATION
SUBMITTAL STAMP

THIS SHOP DRAWING HAS BEEN REVIEWED BY PARIC CORPORATION

Subcontractor remains responsible for dimensions, quantities, coordination with other trades and compliance with contract documents.

Ry:

By:
Devin D. Gates

REVIEWED BY	DATE

A/E COMMENTS

- ☐
- See attached sheet(s) for additional comments

REVIEWED BY	DATE



77 Westport Plaza
Suite 250
St. Louis, MO 63146

TRANSMITTAL

No. 15051-0147

Paric Corporation

PROJECT: 15051-Webster University Interdisciplinary Science Building

DATE: 07/18/2016

TO: Cannon Design
1100 Clark Ave
St Louis MO 63102

RE: Cabinet unit heaters product data

ATTN: Kelvin Patel

JOB: 15051

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☒ Approval	☒ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	SENT VIA:	☐ Returned
☐ Specifications	☐ Attached	☐ Returned for Corrections
☒ Other:	☐ Separate Cover Via:	☐ Due Date:

Item	Package	Code	Rev.	Copies	Date	Description	Status
Submittal		235000-007	1		07/18/2016	Cabinet unit heaters product data	Submitted

NOTES:

CC:

Signed: _____
Devin Gates



Mechanical

LETTER OF TRANSMITTAL

TO: Paric Corporation

77 West Port Plaza #250

St. Louis, MO 63146

ATTN: Jason Szachnieski, Devin Gates

DATE: 7/15/16

JOB #: 5768

RE: Webster ISB

We are sending you

☒

Shop drawings

☐ Attached

☐ Prints

☐ Under separate cover

☐ Plans

☐ Samples

☐ Specifications

☐ Copy of letter

☐ Change order

☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	7/15/16	235000-2.14	Cabinet Unit Heaters

These are transmitted as checked below:

☐ For signature

☐ For your use

☐ As requested

☐ For bids due

☒

For review and comment

☐ Approved as submitted

☐ Approved as noted

☐ Returned for corrections

☐ Prints returned after loan to us

☐ Other

☐ Resubmit

☒ Submit

☐ Return

☐ copies for approval

☐ copies for distribution

☐ corrected prints

Remarks:

COPY TO: file

SIGNED:

Alex Chambers



Mechanical

Webster University ISB Webster Groves, MO

Submittal #:

25300-2.14

Submittal Description:

Cabinet Unit Heaters

Return By:

7/29/16

Please Note: To avoid scheduling delays and equipment release delays, please submit by the "Return By" date.

CHECKED BY:			
DESIGNER: JS		ENGINEER: MD	
☒	NO EXCEPTION TAKEN	☐	MAKE CORRECTIONS NOTED
☐	SUBMIT SPECIFIED ITEM	☐	REVISE AND RESUBMIT
☐	REJECTED	☐	
Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Equipment supplier is responsible for: dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and satisfactory performance of his work.			
		Job #:	5768
		Date:	7/15/16
		By:	ARC